

REMARKS

Upon entry of the instant amendment, claims 1 and 3-11 will remain pending in the above identified application and stand ready for further action on the merits.

The amendments made herein to the specification do not incorporate new matter in the application as originally filed, since the amendments find support in the originally filed application. Further, **no new matter was included in the substitute specification filed on February 13, 2007, as explained below.** The present amendment to the specification serves to limit the scope of the inorganic fiber to “carbon fiber”.

The amendments made herein to pending claims 1, 3 and 9 do not incorporate new matter in the application as originally filed, since the same find support in the originally filed application. The claim limitation, “into which a molten metal is poured,” finds support at page 9, lines 15-17 and page 13, lines 1-3 of the specification. The claim limitation “for reducing thermal shrinkage,” finds support at page 4, lines 25-29 of the specification. The claim limitation “the base paper is wound with an overlap between adjacent turns or a plurality of base papers are wound one on top of another,” finds support at page 3, lines 16-26 of the specification.

Accordingly, entry of the instant amendment is respectfully requested at present, as is a favorable allowance of each of instantly pending claims 1 and 3-11.

Substitute Specification

The amendments made to the specification in the earlier filed reply of February 13, 2007 were presented by way of a Substitute Specification in accordance with the provisions of 37 CFR § 1.125. Both a “Clean Copy” and a “Marked-Up Copy” of the Substitute Specification were provided with the reply dated February 13, 2007. The marked-up copy of the substitute specification shows all the changes relative to the immediate prior version of the

specification in accordance with the provisions of 37 CFR § 1.125(c). No new matter was included in the substitute specification as submitted on February 13, 2007 as stated in the response in the subsection entitled "Substitute Specification" at the paragraph bridging pages 5 and 6. Therefore, the substitute specification is in accordance with the provisions of 37 CFR § 1.125 and should be entered.

Claim Rejections –35 USC § 103(a)

Claims 1-11 have been rejected under the provisions of 35 USC § 103(a) as being unpatentable over **Brown et al. US '166** (US 4,981,166) in view of **Lee US '390** (US 5,989,390).

Claims 1-11 have been rejected under the provisions of 35 USC § 103(a) as being unpatentable over **Brown et al. US '166** (US 4,981,166) in view of **Chuluda US '801** (US 4,256,801).

Claims 1-3, 7-9 and 11 have been rejected under the provisions of 35 USC § 103(a) as being unpatentable over **Brown et al. US '166** (US 4,981,166) in view of **Ling-Chen US '874** (US 6,540,874).

Reconsideration and withdraw of each of the above rejections is respectfully requested based on the following considerations.

Legal Standard for Determining Prima Facie Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally,

the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit

showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Distinctions Over the Cited Art

As indicated above, claim 1 as instantly amended herein recites as follows.

*A part for casting, into which a molten metal is poured, comprising base paper for paper tubing and containing an organic fiber, a carbon fiber for reducing thermal shrinkage, and a binder, the base paper being spiral-wound into a tube such that the base paper is wound with an overlap between adjacent turns or a plurality of base papers are wound one on top of another, **the total content of carbon fiber being 7 to 80 parts by weight, and the total weight of the organic fiber, the carbon fiber, and the binder being taken as 100 parts weight. (emphasis added)***

The Examiner has relied upon Brown US ‘166 to show the use of a sand mold in the manufacture of a feed tube for molten metal casting. However, Brown US ‘166 does *not* show the particular composition and orientation of the base paper as claimed. Notably, Brown US ‘166 teaches that it is a particularly important feature of the invention to have a space between the edges of each cylindrically wrapped sheet to provide a plurality of spaces or openings extending through the sleeve (e.g., see *Brown US ‘166 Abstract and column 4, lines 18-32*). In

contrast, the present application clearly teaches that the base paper is wound with an overlap between adjacent turns or a plurality of base papers are wound one on top of another.

The Examiner turns to Lee US '390, Chuluda US '801 and Ling-Chen US '874 as secondary references to Brown US '166, to demonstrate various paper compositions that comprise organic fibers, carbon fibers and binders to create paper products of increased heat resistance. However, the inventions of Lee US '390, Chuluda US '801 and Ling-Chen US '874 are not properly combinable with Brown US '166, inasmuch as they relate to non-analogous art field from Brown US '166 and the conditions of use are different.

“The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art must be considered *to the extent that they are in analogous arts.*” (Emphasis added) MPEP 2143.01(II).

Lee US '390 relates to the invention used for torque convertor clutch facing plates (see column 4). Chuluda US '801 relates to the invention used for automotive automatic transmission such as clutches and brakes (see abstract, column 1). Ling-Chen US '874 relates to the invention used for heater panels used under a temperature of 80° to 90°C (see column 4). Each of these fields of endeavor differs drastically from Brown US '166.

Additionally, the inventions of the secondary references of Lee US '390, Chuluda US '801 and Ling-Chen US '874 are used under far lower temperature. “A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering the problem.” Wang Laboratories Inc. v Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993). Here, one of ordinary skill would not look to the cited secondary references to arrive at the presently claimed invention because they are not useful within the practice of the instantly claimed invention. As illustrated in Example 1 of the present specification, the present invention is a part for casting, into which a molten metal is poured. Thus, it is clear that none of Lee US '390, Chuluda US '801 and Ling-Chen US '874 are suitable for this purpose.

Applicants have submitted herein for the Examiner's consideration, evidence supporting the assertion that the present invention obtains the advantageous property of excellent thermal shrinking. Specifically, attached **Document 1** is a graph showing a relation between content of inorganic fiber and thermal shrinking ratio of the element made by papermaking for use for the production of a die casting. Any one of carbon fiber, basalt fiber, rock wool and ceramic fiber is used as inorganic fiber. As shown in the graph, where the content of the carbon fiber is 7 parts by weight or more, the thermal shrinking ratio approaches zero. Carbon fiber shows a good thermal shrinking property in comparison with other fibers. Therefore, the graph shows that the use of carbon fiber is superior and is not obvious.

Attached **Document 2** shows a method for preparing a test sample for use in measuring the thermal shrinking ratio of Document 1. The method of measuring the thermal shrinking ratio and the definition of the thermal shrinking ratio are described. All of the cited prior art references are silent with respect to thermal shrinkage.

In view of the foregoing, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey, Reg. No. 32,881, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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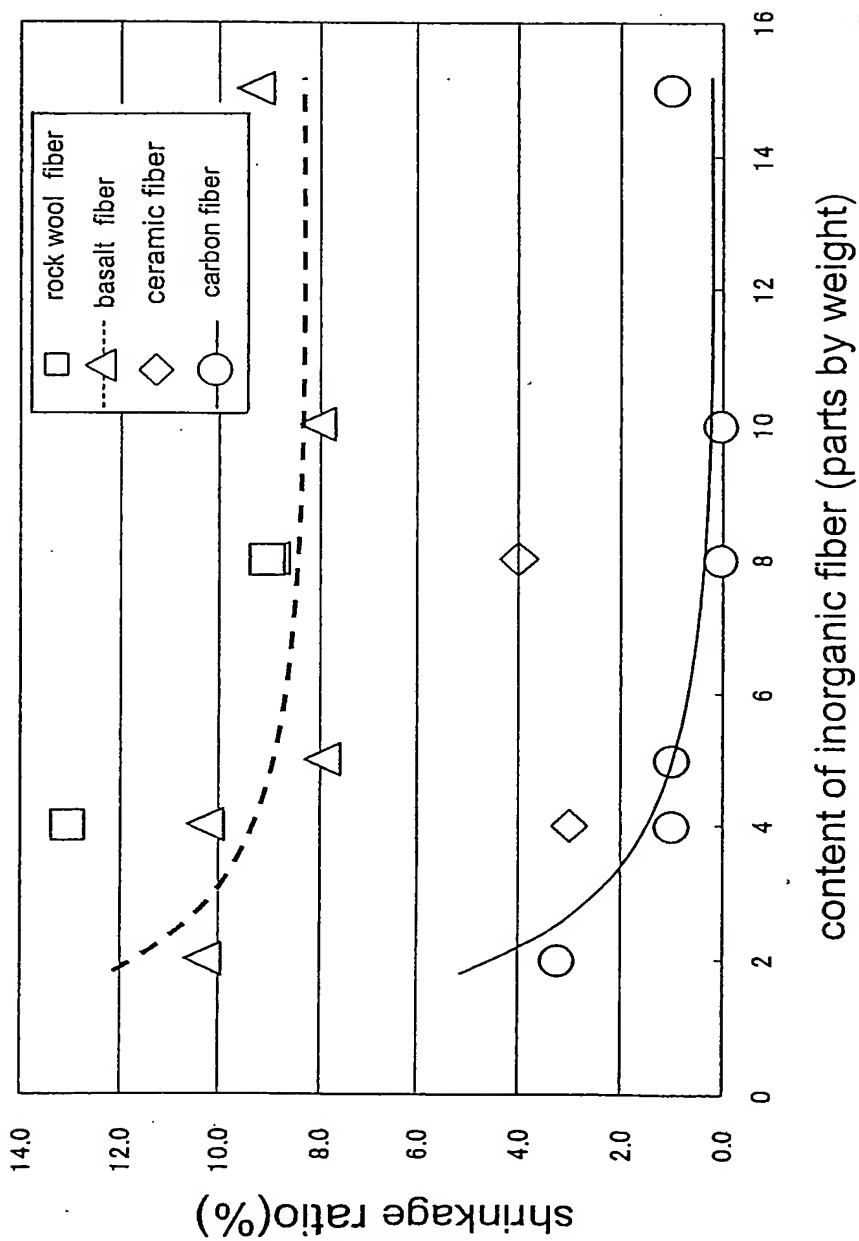
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Enclosures: Document 1 and Document 2





Document 2

Condition of thermal shrinkage test:

A disk like fiber layer 170 mm in diameter was made by papermaking using the slurry shown below. The fiber layer was dewatered and dried to obtain a preform. The test sample was obtained by drying the preform.

Preparation of the slurry:

The organic fiber and the inorganic fiber described below were dispersed in water to prepare an about 1% slurry (a total content of the organic fiber and the inorganic fiber was 1% by weight with respect to water). The binder and the flocculant shown below were added to the slurry (to prepare a stock). The weight mixing ratio of the organic fiber, the inorganic fiber and the organic binder was as shown below.

Composition of the slurry:

Organic fiber: recycled newspapers (average fiber length: 1 mm)

Inorganic fiber: one kind of inorganic fiber is selected from among Carbon fiber (Torayca chopped fiber, available from Toray Industries, Inc.; fiber length: 3 mm), basalt fiber, rock wool and ceramic fiber (aluminosilicate)

Inorganic binder: obsidian (Nicecatch, available from Kinseimatec Co., Ltd.)

Organic binder: phenol resin (Bell Pearl, available from Air Water Inc.)

Flocculant below was added to the slurry.

Flocculant: 0.25 parts by weight of Kaimen (polyamide-epichlorohydrin resin WS4020 from Seiko PMC Corp.) and 0.25 parts by weight of Sodium carboxymethyl cellulose (Cellogen WS-C from Dai-ichi Kogyo Seiyaku Co., Ltd.) per 100 parts by weight of the solids content.

Where the content of the inorganic fiber is A% by weight, weight mixing ratio of the organic fiber, the inorganic fiber, the inorganic binder and the organic binder is shown as follows.

Organic fiber: inorganic fiber: inorganic binder: organic binder = 26: A: (100-26-18-A): 18

Papermaking and dewatering steps:

A cylinder 170 mm in internal diameter was set on a screen of #40 mesh size. The slurry was injected into the cylinder. A wet preform was obtained by suction and dewatering.

Drying step:

The test sample was obtained by pressing the preform between heated metal plates for one minute at 220°C.

Evaluation:

The test sample was cut into 10mm in wide and 20mm in length. The cut piece was heated in the combustion furnace for about 20 seconds at 1100 °C. The thermal shrinking ratio was calculated based on the following formulation.